

Many of my readers will remember the mysterious radio messages which were heard by both amateur and professional short wave operators during the nights of the twenty-third and twenty-fourth of last September, and even more will remember the astounding discovery made by Professor Montescue of the Lick Observatory on the night of September twenty-fifth. At the time, some inspired writers tried to connect the two events, maintaining that the discovery of the fact that the earth had a new satellite coincident with the receipt of the mysterious messages was evidence that the new planetoid was inhabited and that the messages were attempts on the part of the inhabitants to communicate with us.

The fact that the messages were on a lower wave length than any receiver then in existence could receive with any degree of clarity, and the additional fact that they appeared to come from an immense distance lent a certain air of plausibility to these ebullitions in the Sunday magazine sections. For some weeks the feature writers harped on the subject, but the hurried construction of new receivers which

would work on a lower wave length yielded no results, and the solemn pronouncements of astronomers to the effect that the new celestial body could by no possibility have an atmosphere on account of its small size finally put an end to the talk. So the matter lapsed into oblivion.

While quite a few people will remember the two events I have noted, I doubt whether there are five hundred people alive who will remember anything at all about the disappearance of Dr. Livermore of the University of Calvada on September twenty-third. He was a man of some local prominence, but he had no more than a local fame, and few papers outside of California even noted the event in their columns. I do not think that anyone ever tried to connect up his disappearance with the radio messages or the discovery of the new earthly satellite; yet the three events were closely bound up together, and but for the Doctor's disappearance, the other two would never have happened.

Dr. Livermore taught physics at Calvada, or at least he taught the subject when he remembered that he

had a class and felt like teaching. His students never knew whether he would appear at class or not; but he always passed everyone who took his courses and so, of course, they were always crowded. The University authorities used to remonstrate with him, but his ability as a research worker was so well known and recognized that he was allowed to go about as he pleased. He was a bachelor who lived alone and who had no interests in life, so far as anyone knew, other than his work.

I first made contact with him when I was a freshman at Calvada, and for some unknown reason he took a liking to me. My father had insisted that I follow in his footsteps as an electrical engineer; as he was paying my bills, I had to make a show at studying engineering while I clandestinely pursued my hobby, literature. Dr. Livermore's courses were the easiest in the school and they counted as science, so I regularly registered for them, cut them, and attended a class in literature as an auditor. The Doctor used to meet me on the campus and laughingly scold me for my absence, but he was really in sympathy with my

ambition and he regularly gave me a passing mark and my units of credit without regard to my attendance, or, rather, lack of it.

When I graduated from Calvada I was theoretically an electrical engineer. Practically I had a pretty good knowledge of contemporary literature and knew almost nothing about my so-called profession. I stalled around Dad's office for a few months until I landed a job as a cub reporter on the San Francisco *Graphic* and then I quit him cold. When the storm blew over, Dad admitted that you couldn't make a silk purse out of a sow's ear and agreed with a grunt to my new line of work. He said that I would probably be a better reporter than an engineer because I couldn't by any possibility be a worse one, and let it go at that. However, all this has nothing to do with the story. It just explains how I came to be acquainted with Dr. Livermore, in the first place, and why he sent for me on September twenty-second, in the second place.

The morning of the twenty-second the City Editor called me in and asked me if I knew "Old Liverpills."

"He says that he has a good story ready to break but he won't talk to anyone but you," went on Barnes. "I offered to send out a good man, for when Old Liverpills starts a story it ought to be good, but all I got was a high powered bawling out. He said that he would talk to you or no one and would just as soon talk to no one as to me any longer. Then he hung up. You'd better take a run out to Calvada and see what he has to say. I can have a good man rewrite your drivel when you get back."

I was more or less used to that sort of talk from Barnes so I paid no attention to it. I drove my flivver down to Calvada and asked for the Doctor.

"Dr. Livermore?" said the bursar. "Why, he hasn't been around here for the last ten months. This is his sabbatical year and he is spending it on a ranch he owns up at Hat Creek, near Mount Lassen. You'll have to go there if you want to see him."

I knew better than to report back to Barnes without the story, so there was nothing to it but to drive up to Hat Creek, and a long, hard drive it was. I made

Redding late that night; the next day I drove on to Burney and asked for directions to the Doctor's ranch.

"So you're going up to Doc Livermore's, are you?" asked the Postmaster, my informant. "Have you got an invitation?"

I assured him that I had.

"It's a good thing," he replied, "because he don't allow anyone on his place without one. I'd like to go up there myself and see what's going on, but I don't want to get shot at like old Pete Johnson did when he tried to drop in on the Doc and pay him a little call. There's something mighty funny going on up there."

Naturally I tried to find out what was going on but evidently the Postmaster, who was also the express agent, didn't know. All he could tell me was that a "lot of junk" had come for the Doctor by express and that a lot more had been hauled in by truck from Redding.

"What kind of junk?" I asked him.

"Almost everything, Bub: sheet steel, machinery, batteries, cases of glass, and Lord knows what all. It's been going on ever since he landed there. He has a bunch of Indians working for him and he don't let a white man on the place."

Forced to be satisfied with this meager information, I started old Lizzie and lit out for the ranch. After I had turned off the main trail I met no one until the ranch house was in sight. As I rounded a bend in the road which brought me in sight of the building, I was forced to put on my brakes at top speed to avoid running into a chain which was stretched across the road. An Indian armed with a Winchester rifle stood behind it, and when I stopped he came up and asked my business.

"My business is with Dr. Livermore," I said tartly.

"You got letter?" he inquired.

"No," I answered.

"No ketchum letter, no ketchum Doctor," he replied,

and walked stolidly back to his post.

"This is absurd," I shouted, and drove Lizzie up to the chain. I saw that it was merely hooked to a ring at the end, and I climbed out and started to take it down. A thirty-thirty bullet embedded itself in the post an inch or two from my head, and I changed my mind about taking down that chain.

"No ketchum letter, no ketchum Doctor," said the Indian laconically as he pumped another shell into his gun.

I was balked, until I noticed a pair of telephone wires running from the house to the tree to which one end of the chain was fastened.

"Is that a telephone to the house?" I demanded.

The Indian grunted an assent.

"Dr. Livermore telephoned me to come and see him," I said. "Can't I call him up and see if he still wants to see me?"

The Indian debated the question with himself for a minute and then nodded a doubtful assent. I cranked the old coffee mill type of telephone which I found, and presently heard the voice of Dr. Livermore.

"This is Tom Faber, Doctor," I said. "The *Graphic* sent me up to get a story from you, but there's an Indian here who started to murder me when I tried to get past your barricade."

"Good for him," chuckled the Doctor. "I heard the shot, but didn't know that he was shooting at you. Tell him to talk to me."

The Indian took the telephone at my bidding and listened for a minute.

"You go in," he agreed when he hung up the receiver.

He took down the chain and I drove on up to the house, to find the Doctor waiting for me on the veranda.

"Hello, Tom," he greeted me heartily. "So you had

trouble with my guard, did you?"

"I nearly got murdered," I said ruefully.

"I expect that Joe would have drilled you if you had tried to force your way in," he remarked cheerfully. "I forgot to tell him that you were coming to-day. I told him you would be here yesterday, but yesterday isn't to-day to that Indian. I wasn't sure you would get here at all, in point of fact, for I didn't know whether that old fool I talked to in your office would send you or some one else. If anyone else had been sent, he would have never got by Joe, I can tell you. Come in. Where's your bag?"

"I haven't one," I replied. "I went to Calvada yesterday to see you, and didn't know until I got there that you were up here."

The Doctor chuckled.

"I guess I forgot to tell where I was," he said. "That man I talked to got me so mad that I hung up on him before I told him. It doesn't matter, though. I can dig

you up a new toothbrush, and I guess you can make out with that. Come in."

I followed him into the house, and he showed me a room fitted with a crude bunk, a washstand, a bowl and a pitcher.

"You won't have many luxuries here, Tom," he said, "but you won't need to stay here for more than a few days. My work is done: I am ready to start. In fact, I would have started yesterday instead of to-day, had you arrived. Now don't ask any questions; it's nearly lunch time."

"What's the story, Doctor?" I asked after lunch as I puffed one of his excellent cigars. "And why did you pick me to tell it to?"

"For several reasons," he replied, ignoring my first question. "In the first place, I like you and I think that you can keep your mouth shut until you are told to open it. In the second place, I have always found that you had the gift of vision or imagination and have the ability to believe. In the third place, you are the only

man I know who had the literary ability to write up a good story and at the same time has the scientific background to grasp what it is all about. Understand that unless I have your promise not to write this story until I tell you that you can, not a word will I tell you."

I reflected for a moment. The *Graphic* would expect the story when I got back, but on the other hand I knew that unless I gave the desired promise, the Doctor wouldn't talk.

"All right," I assented, "I'll promise."

"Good!" he replied. "In that case, I'll tell you all about it. No doubt you, like the rest of the world, think that I'm crazy?"

"Why, not at all," I stammered. In point of fact, I had often harbored such a suspicion.

"Oh, that's all right," he went on cheerfully. "I *am* crazy, crazy as a loon, which, by the way, is a highly sensible bird with a well balanced mentality. There is no doubt that I am crazy, but my craziness is not of

the usual type. Mine is the insanity of genius."

He looked at me sharply as he spoke, but long sessions at poker in the San Francisco Press Club had taught me how to control my facial muscles, and I never batted an eye. He seemed satisfied, and went on.

"From your college work you are familiar with the laws of magnetism," he said. "Perhaps, considering just what your college career really was, I might better say that you are supposed to be familiar with them."

I joined with him in his laughter.

"It won't require a very deep knowledge to follow the thread of my argument," he went on. "You know, of course, that the force of magnetic attraction is inversely proportional to the square of the distances separating the magnet and the attracted particles, and also that each magnetized particle had two poles, a positive and a negative pole, or a north pole and a south pole, as they are usually called?"

I nodded.

"Consider for a moment that the laws of magnetism, insofar as concerns the relation between distance and power of attraction, are exactly matched by the laws of gravitation."

"But there the similarity between the two forces ends," I interrupted.

"But there the similarity does *not* end," he said sharply. "That is the crux of the discovery which I have made: that magnetism and gravity are one and the same, or, rather, that the two are separate, but similar manifestations of one force. The parallel between the two grows closer with each succeeding experiment. You know, for example, that each magnetized particle has two poles. Similarly each gravitized particle, to coin a new word, had two poles, one positive and one negative. Every particle on the earth is so oriented that the negative poles point toward the positive center of the earth. This is what causes the commonly known phenomena of gravity or weight."

"I can prove the fallacy of that in a moment," I retorted.

"There are none so blind as those who will not see," he quoted with an icy smile. "I can probably predict your puerile argument, but go ahead and present it."

"If two magnets are placed so that the north pole of one is in juxtaposition to the south pole of the other, they attract one another," I said. "If the position of the magnets be reversed so that the two similar poles are opposite, they will repel. If your theory were correct, a man standing on his head would fall off the earth."

"Exactly what I expected," he replied. "Now let me ask you a question. Have you ever seen a small bar magnet placed within the field of attraction of a large electromagnet? Of course you have, and you have noticed that, when the north pole of the bar magnet was pointed toward the electromagnet, the bar was attracted. However, when the bar was reversed and the south pole pointed toward the electromagnet, the bar was still attracted. You doubtless remember that experiment."

"But in that case the magnetism of the electromagnet was so large that the polarity of the small magnet was reversed!" I cried.

"Exactly, and the field of gravity of the earth is so great compared to the gravity of a man that when he stands on his head, his polarity is instantly reversed."

I nodded. His explanation was too logical for me to pick a flaw in it.

"If that same bar magnet were held in the field of the electromagnet with its north pole pointed toward the magnet and then, by the action of some outside force of sufficient power, its polarity were reversed, the bar would be repelled. If the magnetism were neutralized and held exactly neutral, it would be neither repelled nor attracted, but would act only as the force of gravity impelled it. Is that clear?"

"Perfectly," I assented.

"That, then, paves the way for what I have to tell you. I have developed an electrical method of neutralizing

the gravity of a body while it is within the field of the earth, and also, by a slight extension, a method of entirely reversing its polarity."

I nodded calmly.

"Do you realize what this means?" he cried.

"No," I replied, puzzled by his great excitement.

"Man alive," he cried, "it means that the problem of aerial flight is entirely revolutionized, and that the era of interplanetary travel is at hand! Suppose that I construct an airship and then render it neutral to gravity. It would weigh nothing, *absolutely nothing*! The tiniest propeller would drive it at almost incalculable speed with a minimum consumption of power, for the only resistance to its motion would be the resistance of the air. If I were to reverse the polarity, it would be repelled from the earth with the same force with which it is now attracted, and it would rise with the same acceleration as a body falls toward the earth. It would travel to the moon in two hours and forty minutes."

"Air resistance would—"

"There is no air a few miles from the earth. Of course, I do not mean that such a craft would take off from the earth and land on the moon three hours later. There are two things which would interfere with that. One is the fact that the propelling force, the gravity of the earth, would diminish as the square of the distance from the center of the earth, and the other is that when the band of neutral attraction, or rather repulsion, between the earth and the moon had been reached, it would be necessary to decelerate so as to avoid a smash on landing. I have been over the whole thing and I find that it would take twenty-nine hours and fifty-two minutes to make the whole trip. The entire thing is perfectly possible. In fact, I have asked you here to witness and report the first interplanetary trip to be made."

"Have you constructed such a device?" I cried.

"My space ship is finished and ready for your inspection," he replied. "If you will come with me, I will show it to you."

Hardly knowing what to believe, I followed him from the house and to a huge barnlike structure, over a hundred feet high, which stood nearby. He opened the door and switched on a light, and there before me stood what looked at first glance to be a huge artillery shell, but of a size larger than any ever made. It was constructed of sheet steel, and while the lower part was solid, the upper sections had huge glass windows set in them. On the point was a mushroom shaped protuberance. It measured perhaps fifty feet in diameter and was one hundred and forty feet high, the Doctor informed me. A ladder led from the floor to a door about fifty feet from the ground.

I followed the Doctor up the ladder and into the space flier. The door led us into a comfortable living room through a double door arrangement.

"The whole hull beneath us," explained the Doctor, "is filled with batteries and machinery except for a space in the center, where a shaft leads to a glass window in the bottom so that I can see behind me, so to speak. The space above is filled with storerooms and the air purifying apparatus. On this level is my bedroom,

kitchen, and other living rooms, together with a laboratory and an observatory. There is a central control room located on an upper level, but it need seldom be entered, for the craft can be controlled by a system of relays from this room or from any other room in the ship. I suppose that you are more or less familiar with imaginative stories of interplanetary travel?"

I nodded an assent.

"In that case there is no use in going over the details of the air purifying and such matters," he said. "The story writers have worked out all that sort of thing in great detail, and there is nothing novel in my arrangements. I carry food and water for six months and air enough for two months by constant renovating. Have you any question you wish to ask?"

"One objection I have seen frequently raised to the idea of interplanetary travel is that the human body could not stand the rapid acceleration which would be necessary to attain speed enough to ever get anywhere. How do you overcome this?"

"My dear boy, who knows what the human body can stand? When the locomotive was first invented learned scientists predicted that the limit of speed was thirty miles an hour, as the human body could not stand a higher speed. To-day the human body stands a speed of three hundred and sixty miles an hour without ill effects. At any rate, on my first trip I intend to take no chances. We know that the body can stand an acceleration of thirty-two feet per second without trouble. That is the rate of acceleration due to gravity and is the rate at which a body increases speed when it falls. This is the acceleration which I will use.

"Remember that the space traveled by a falling body in a vacuum is equal to one half the acceleration multiplied by the square of the elapsed time. The moon, to which I intend to make my first trip, is only 280,000 miles, or 1,478,400,000 feet, from us. With an acceleration of thirty-two feet per second, I would pass the moon two hours and forty minutes after leaving the earth. If I later take another trip, say to Mars, I will have to find a means of increasing my acceleration, possibly by the use of the rocket

principle. Then will be time enough to worry about what my body will stand."

A short calculation verified the figures the Doctor had given me, and I stood convinced.

"Are you really going?" I asked.

"Most decidedly. To repeat, I would have started yesterday, had you arrived. As it is, I am ready to start at once. We will go back to the house for a few minutes while I show you the location of an excellent telescope through which you may watch my progress, and instruct you in the use of an ultra-short-wave receiver which I am confident will pierce the Heaviside layer. With this I will keep in communication with you, although I have made no arrangements for you to send messages to me on this trip. I intend to go to the moon and land. I will take atmosphere samples through an air port and, if there is an atmosphere which will support life, I will step out on the surface. If there is not, I will return to the earth."

A few minutes was enough for me to grasp the simple manipulations which I would have to perform, and I followed him again to the space flier.

"How are you going to get it out?" I asked.

"Watch," he said.

He worked some levers and the roof of the barn folded back, leaving the way clear for the departure of the huge projectile. I followed him inside and he climbed the ladder.

"When I shut the door, go back to the house and test the radio," he directed.

The door clanged shut and I hastened into the house. His voice came plainly enough. I went back to the flier and waved him a final farewell, which he acknowledged through a window; then I returned to the receiver. A loud hum filled the air, and suddenly the projectile rose and flew out through the open roof, gaining speed rapidly until it was a mere speck in the sky.



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It vanished. I had no trouble in picking him up with the telescope. In fact, I could see the Doctor through one of the windows.

"I have passed beyond the range of the atmosphere,

Tom," came his voice over the receiver, "and I find that everything is going exactly as it should. I feel no discomfort, and my only regret is that I did not install a transmitter in the house so that you could talk to me; but there is no real necessity for it. I am going to make some observations now, but I will call you again with a report of progress in half-an-hour."

For the rest of the afternoon and all of that night I received his messages regularly, but with the coming of daylight they began to fade. By nine o'clock I could get only a word here and there. By noon I could hear nothing. I went to sleep hoping that the night would bring better reception, nor was I disappointed. About eight o'clock I received a message, rather faintly, but none the less distinctly.

"I regret more than ever that I did not install a transmitter so that I could learn from you whether you are receiving my messages," his voice said faintly. "I have no idea of whether you can hear me or not, but I will keep on repeating this message every hour while my battery holds out. It is now thirty hours since I left the earth and I should be on the moon,

according to my calculations. But I am not, and never will be. I am caught at the neutral point where the gravity of the earth and the moon are exactly equal.

"I had relied on my momentum to carry me over this point. Once over it, I expected to reverse my polarity and fall on the moon. My momentum did not do so. If I keep my polarity as it was when left the earth, both the earth and the moon repel me. If I reverse it, they both attract me, and again I cannot move. If I had equipped my space flier with a rocket so that I could move a few miles, or even a few feet, from the dead line, I could proceed, but I did not do so, and I cannot move forward or back. Apparently I am doomed to stay here until my air gives out. Then my body, entombed in my space ship, will endlessly circle the earth as a satellite until the end of time. There is no hope for me, for long before a duplicate of my device equipped with rockets could be constructed and come to my rescue, my air would be exhausted. Good-by, Tom. You may write your story as soon as you wish. I will repeat my message in one hour. Good-by!"

At nine and at ten o'clock the message was repeated.

At eleven it started again but after a few sentences the sound suddenly ceased and the receiver went dead. I thought that the fault was with the receiver and I toiled feverishly the rest of the night, but without result. I learned later that the messages heard all over the world ceased at the same hour.

The next morning Professor Montescue announced his discovery of the world's new satellite.